37428

easYgen-2000 Series
Genset Control

Operation
Software Version 1.xxxx

EASYGEN 2000

Manual 37428

WARNING

Read this entire manual and all other publications pertaining to the work to be performed before installing, operating, or servicing this equipment. Practice all plant and safety instructions and precautions. Failure to follow instructions can cause personal injury and/or property damage.

The engine, turbine, or other type of prime mover should be equipped with an overspeed (overtemperature, or overpressure, where applicable) shutdown device(s), that operates totally independently of the prime mover control device(s) to protect against runaway or damage to the engine, turbine, or other type of prime mover with possible personal injury or loss of life should the mechanical-hydraulic governor(s) or electric control(s), the actuator(s), fuel control(s), the driving mechanism(s), the linkage(s), or the controlled device(s) fail.

Any unauthorized modifications to or use of this equipment outside its specified mechanical, electrical, or other operating limits may cause personal injury and/or property damage, including damage to the equipment. Any such unauthorized modifications: (i) constitute "misuse" and/or "negligence" within the meaning of the product warranty thereby excluding warranty coverage for any resulting damage, and (ii) invalidate product certifications or listings.

CAUTION

To prevent damage to a control system that uses an alternator or battery-charging device, make sure the charging device is turned off before disconnecting the battery from the system.

Electronic controls contain static-sensitive parts. Observe the following precautions to prevent damage to these parts.

- **Discharge body static before handling the control (with power to the control turned off, contact a grounded surface and maintain contact while handling the control).**
- **Avoid all plastic, vinyl, and Styrofoam (except antistatic versions) around printed circuit boards.**
- **Do not touch the components or conductors on a printed circuit board with your hands or with conductive devices.**

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Important definitions

WARNING

Indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury.

CAUTION

Indicates a potentially hazardous situation that, if not avoided, could result in damage to equipment.

NOTE

Provides other helpful information that does not fall under the warning or caution categories.

Revision History

Rev.	Date	Editor	Changes
NEW	09-06-09	TE	Release

Content

Figures And Tables

Figures

Tables

Chapter 1.
General Information

Document Overview

Type		English	German
easYgen-2000 Series			
easYgen-2000 Series - Installation		37426	DE37426
easYgen-2000 Series - Configuration		37427	DE37427
easYgen-2000 Series - Operation	this manual ⇨	37428	DE37428
easYgen-2000 Series - Application		37429	-
easYgen-2000 Series - Interfaces		37430	-
easYgen-2000 Series - Parameter List		37431	DE37431
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Table 1-1: Manual - Overview

Intended Use The unit must only be operated as described in this manual. The prerequisite for a proper and safe operation of the product is correct transportation, storage, and installation as well as careful operation and maintenance.

NOTE

This manual has been developed for a unit equipped with all available options. Inputs/outputs, functions, configuration screens, and other details described which do not exist on your unit may be ignored.

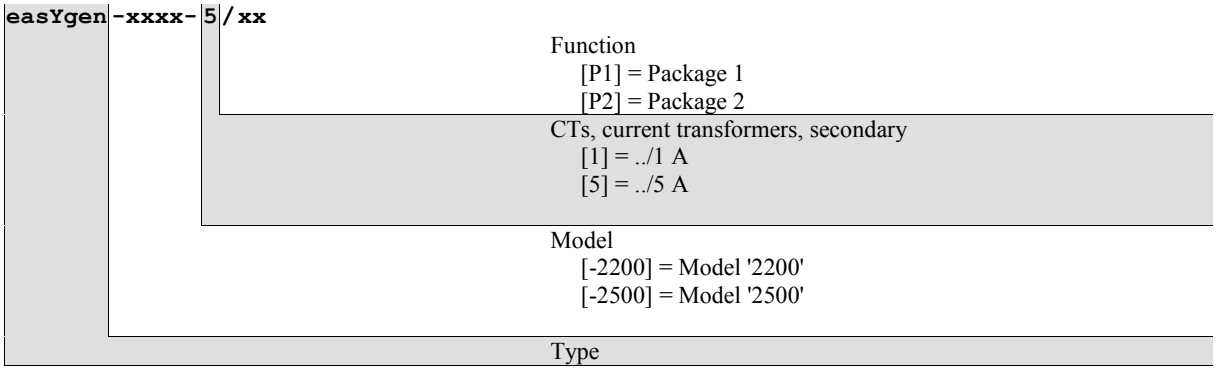
The present manual has been prepared to enable the installation and commissioning of the unit. Because of the large variety of parameter settings, it is not possible to cover every combination. The manual is therefore only a guide. In case of incorrect entries or a total loss of functions, the default settings may be taken from the list of parameters in the configuration manual 37427 or from ToolKit and the respective *.SID file.

Short Description

The easYgen-2000 Series generator set controllers provide the following functions:

- Genset control
- Engine, mains and generator protection
- Engine data measurement -
  - oil pressure and temperature, coolant temperature, battery voltage, speed, service hours, etc.
- Generator and mains data measurement -
  - voltage, current, power, kvar, kW, kWh, etc.
- Load/var sharing for up to 16 participants
- Load-dependent start/stop
- Automatic, Manual, and Stop operating modes
- Application modes -
  - no CB operation
  - open GCB
  - open/close GCB
  - open/close GCB/MCB
- *LogicsManager* for processing measured values, discrete inputs, and internal states
- Engine starter sequencing
- Alarm display with circuit breaker trip and engine shutdown
- AMF (automatic mains failure) standby genset control, with automatic engine start on a mains failure detection and open transition breaker control
- Critical mode operation
- Synchronizing (phase matching and slip frequency) and mains parallel operation
- External frequency, voltage, power, and power factor set point control via analog input or interface
- FIFO event history with 300 entries
- Multilingual user interface (English, German, French, Spanish, Italian, Portuguese, Turkish, Russian, Chinese, Japanese, Polish)
- ECU data visualization via J1939
- CAN bus communication to engine controllers, plant management systems, expansion boards, and ToolKit configuration and visualization software
- RS-485 Modbus communication with plant management systems
- RS-232 Modbus communication with plant management systems and ToolKit configuration and visualization software

Type designation is as follows:



Examples:
EASYGEN-2200-5/P2 (easYgen-2200, 120 & 480 Vac inputs, ../5 A measuring inputs)
EASYGEN-2500-1/P1 (easYgen-2500, 120 & 480 Vac inputs, ../1 A measuring inputs)

Chapter 2.
Navigation / Operation

Figure 2-1: Front panel and display

Figure 2-1 illustrates the front panel/display of the easYgen-2000 Series with push buttons, LEDs and Liquid Crystal display (LC display). A short description of the front panel is given below.

NOTE

This push button is always active and will stop the engine when pressed, except the operating modes are selected externally. In this case, the AUTO and MAN Mode push buttons are also disabled.

Fct.-block

Function blocks

Buttons that have the same function within one screen are grouped into function blocks. The function blocks are defined as:

Display..... Change the method of voltage and power calculations displayed (page 25).
Mode..... Change the mode of operation (page 28).
Operation.... Used to perform manual operation of the genset and the breakers (page 29).
Navigation... Navigation between system and configuration screens, and alarm list (page 29).

① ② ③ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪

Push buttons

The push buttons on the front panel are assigned to softkeys on the display. Each softkey is assigned to a function depending on the mode of operation.

⑫

Liquid Crystal Display (LC display)

The display contains softkey characters, measuring values, modes of operation, and alarms. The functionality of the display screens as well as the description of the functions is detailed in the "Navigation" section (page 8).

⑬ ⑭

LED

The left LED ⑬ indicates that the unit is in STOP mode. The right LED ⑭ indicates that alarm messages are active / present in the control unit.

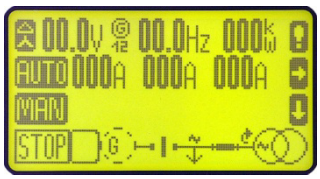
Navigation

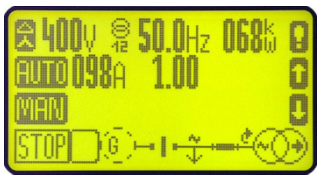
Individual display screens are listed in the following text. All softkeys, which are available in the individual screens are described with their function.

Screen "Operating values - overview" / "Starting screen" **[all application modes]**

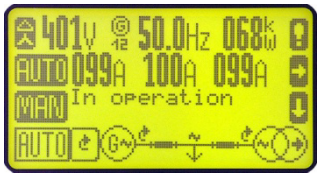
This screen appears upon startup of the unit.

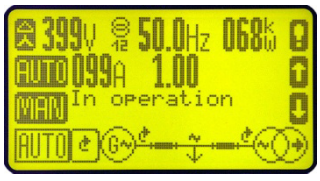
STOP operating mode:



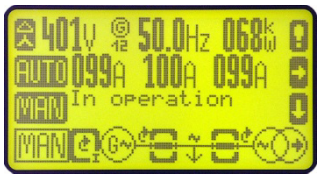


AUTOMATIC operating mode:





MANUAL operating mode:



Toggle between delta/wye voltage display. The index of the "**V**" symbol indicates whether delta or wye voltage is displayed and which phases are displayed.

Change into AUTOMATIC operating mode.

Change into MANUAL operating mode.

Change into STOP operating mode.

Display the alarm list (unacknowledged alarms).

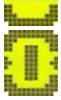
Display the “Parameter” screen.

Scroll down to “Mains values” screen. A second click displays the “Main menu” screen.

This softkey is only displayed in front of the mains symbol if the Alarm LED is flashing (An alarm is present, which has not yet been acknowledged as 'Seen'). This softkey resets the horn and acknowledges the alarm as 'Seen'.

Operating mode MANUAL: start/stop engine.

Operating mode MANUAL: open GCB/MCB.



Operating mode MANUAL: close GCB/MCB.

NOTE

If the mains data display is disabled (refer to Configuration Manual 37427), above screens will only show generator data with bigger digits.

Screen "Alarm list" **[all application modes]**

This screen appears after pressing the "Alarm" softkey in the starting screen. All alarm messages, which have not been acknowledged and cleared, are displayed. Each alarm is displayed with the alarm message and the date and time of the alarm occurred in the format yy-mon-dd hh:mm:ss.ss. Please note, that self-acknowledging alarm messages get a new timestamp when initializing the unit (switching on). The symbol indicates that this alarm condition is still present. A maximum of 16 alarm messages can be displayed. If 16 alarm messages are already displayed and further alarm messages occur, these will not be displayed before displayed alarm messages are acknowledged and thus deleted from the list.

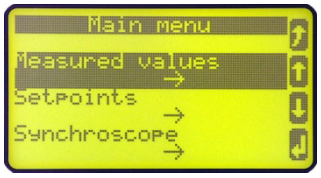
Return to the starting screen.

Scroll up to next alarm message.

Scroll down to next alarm message.

The selected alarm message (displayed inverted) will be acknowledged. This is only possible, if the alarm condition is no longer present. If the Alarm LED is still flashing (an alarm is present, which has not yet been acknowledged as 'Seen'), this softkey resets the horn and acknowledges the alarm as 'Seen'.

Screen "Main Menu" **[all application modes]**



This screen appears after pressing the softkey two times.

Return to the starting screen.

Scroll up to next menu item.

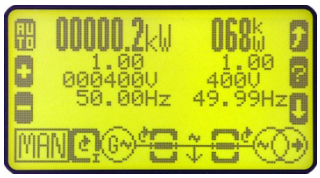
Scroll down to next menu item.

Enter menu item.

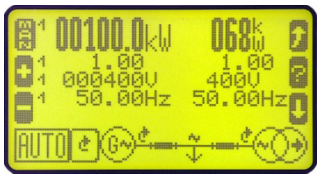
Measured values
Display the measured values screen.
Setpoints
Display the setpoints screen.
Synchroscope
Display the synchroscope screen.
Sequencing
Display the sequencing screen.
Counters and service
Display the counters and service screen.
Diagnostic
Display the diagonstic screen.

Screen "Setpoints" [all application modes]

MANUAL operating mode:



AUTOMATIC operating mode:



This screen appears after pressing the "Setpoints" softkey in the "Main menu" screen. The set point is displayed on the left and the actual value is displayed on the right half of the screen. The symbol indicates the mains power and indicates the generator power. The figures 1 or 2 indicate whether set point 1 or set point 2 is used in AUTOMATIC operation. The source, which is used for set point 1 or set point 2, is displayed with the respective *LogicsManager* function number.
The set points may only be adjusted if the respective controller is enabled. Frequency and voltage may be adjusted within the configured operating limits. Active power may be adjusted between 0 and the configured load control setpoint maximum. The power factor may be adjusted between 0.71 leading and 0.71 lagging.

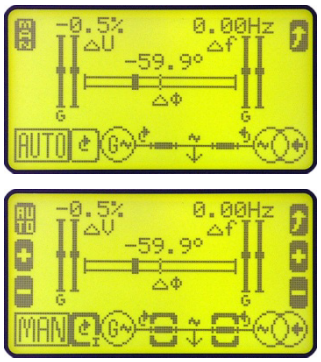
Return to "Main menu" screen.

Change into AUTOMATIC operating mode.
Change into MANUAL operating mode.

Scroll up one set point.
Scroll down one set point.

Raise the selected set point.
Lower the selected set point.
P ..... Real power
Constant = fixed generator load control
Import = fixed import power control
Export = fixed export power control
PF ..... Power factor
V ..... Voltage
f ..... Frequency

Screen "Synchroscope" **[all application modes]**



This screen appears after pressing the "Synchroscope" softkey in the "Main menu" screen. The square symbol indicates the actual phase angle between mains and generator. A complete left position of the square symbol means -180° and complete right position means +180°. The frequency and voltage differences are indicated on the top of the display.


Return to "Main menu" screen.


Change into AUTOMATIC operating mode.
Change into MANUAL operating mode.

Change into STOP operating mode.

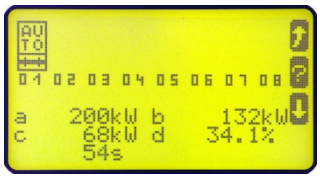

Operating mode MANUAL: Raise voltage/frequency.
Operating mode MANUAL: Lower voltage/frequency.

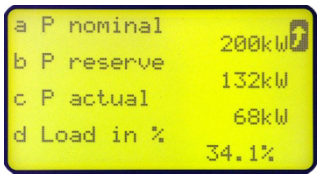

Operating mode MANUAL: start/stop engine.


Operating mode MANUAL: open GCB/MCB.


Operating mode MANUAL: close GCB/MCB.

Screen "Sequencing" **[all application modes]**





This screen appears after pressing the "Sequencing" softkey in the "Main menu" screen. The sequencing screen shows all gensets participating in load sharing and load dependent start/stop. The operation mode of each genset as well as the state of its GCB is shown on this screen. The symbol AUTO above the generator number indicates AUTOMATIC operating mode, MAN indicates MANUAL, and STOP indicates STOP. The field below shows whether the respective GCB is closed ( ) or open ( ). The bottom field displays the actual load dependent start/stop values. If this device is not participating in load dependent start/stop, "LD start stop Off" is displayed here.

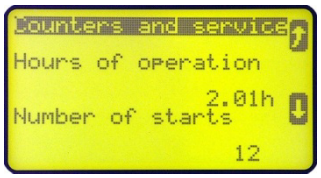
Return to "Main menu" screen.

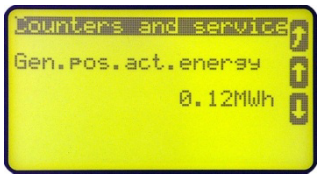
Scroll down to genset 09 through 16 display.

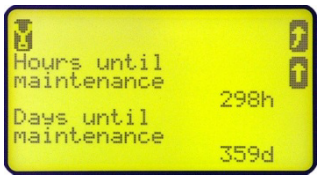
Scroll up to genset 1 through 08 display.

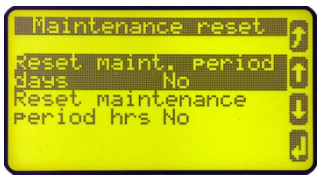
Display the second screen on the left hand side.

Screen "Counters and service" **[all application modes]**









This screen appears after pressing the "Counters and service" softkey in the "Main menu" screen.

Return to "Main menu" screen.

Scroll down to next page.

Scroll up to previous page.

Display the “Maintenance reset” screen.

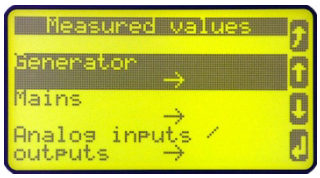
Enter menu item.

Hours of operation 0.00h - Operating hours counter
0.00h = Total operating hours (hours in operation, the decimals are hundredths of an hour)
Number of starts 00 - Start counter
00 = Total number of starts
Gen. positive active energy 0.00 MWh - Generator positive active energy
0.00MWh = Total generator positive active energy
Hours until maintenance 000h - Maintenance counter
000h = Hours until next maintenance
Days until maintenance 000h - Maintenance counter
000h = Days until next maintenance

NOTE

Further information about resetting or setting the counters may be found in the Configuration Manual 37427.

Screen "Measured values" **[all application modes]**



This screen appears after pressing the "Measured values" softkey in the "Main menu" screen.

Return to the "Main menu" screen.

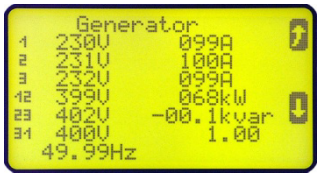
Scroll up to next menu item.

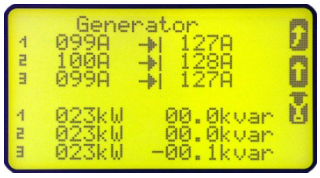
Scroll down to next menu item.

Enter menu item.

Generator
Display the generator indication screen.
Engine (J1939)
Display the Engine (J1939) interface screen.
Mains
Display the mains indication screen.
Analog inputs/outputs
Display the analog inputs and outputs indication screen.
Discrete inputs/outputs
Display the discrete inputs and outputs indication screen.

Screen "Generator" **[all application modes]**





This screen appears after pressing the "Generator" softkey in the "Measured values" screen. All measured generator values are displayed in this screen.

Return to "Measured values" screen.

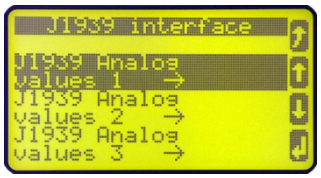
Scroll down display screen to additional generator values.

Scroll up display screen to main generator values.

Reset the maximum value display.

V ..... Voltage
A ..... Current
kW .... Real power
Kvar . Reactive power

Screen "Engine (J1939)" **[all application modes]**



This screen appears after pressing the "Engine (1939)" softkey in the "Measured values" screen.

- Return to the "Measured values" screen.
- Scroll up to next menu item.
- Scroll down to next menu item.
- Enter menu item.

J1939 Analog values 1 - 4
Display the J1939 Analog values screen.
J1939 Status
Display the J1939 Status screen.
J1939 Active diagnosis trouble codes
Display the J1939 Act. Diag. Trouble codes screen.
J1939 Previous diagnosis trouble codes
Display the J1939 Prev.Diag. Trouble codes screen.

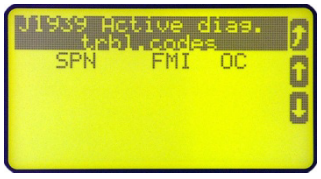
J1939 Analog values 1
Displayed SPN Values: *190, 100, 110, 247, 183, 92, 98, 111, 102, 108, 105, 172, 173, 174, 175, 91, 513*
J1939 Analog values 2
Displayed SPN Values: *52, 94, 95, 101, 106, 107, 109, 127, 157, 171, 176, 177, 441, 442, 513, 1122, 1123, 1124-1126, 1131-1133, 1134, 1135, 1136*
J1939 Analog values 3
Displayed SPN Values: *1137-1156, 1157-1167*
J1939 Analog values 4
Displayed SPN Values: *1172-1175, 1176, 1177, 1178, 1179, 1180, 1181, 1182, 1183, 1184, 1185, 1186, 1187, 1203, 1208, 1212, 1382, 1800, 1801, 1802, 1803, 2433, 2434*

Screen "J1939 Status" **[all application modes]**

This screen appears after pressing the "Engine (J1939)" softkey in the "J1939 interface" screen. The status of the J1939 interface is displayed here.

- Return to "J1939 interface" screen.
- Scroll up to next menu item.
- Scroll down to next menu item.

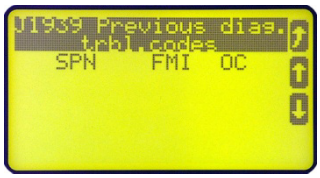
Screen "J1939 Active diag. trbl codes" **[all application modes]**



This screen appears after pressing the "J1939 Active diag. trbl codes" softkey in the "Engine (J1939)" screen. The active J1939 diagnosis trouble codes are displayed here.
SPN = Suspect Parameter Number
FMI = Failure Mode Indicator
OC = Occurrence Count

- Return to "Engine (J1939)" screen.
- Scroll up display screen.
- Scroll down display screen.

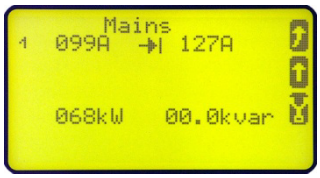
Screen "J1939 Previous diag. trbl codes" **[all application modes]**



This screen appears after pressing the "J1939 Previous diag. trbl codes" softkey in the "Engine (J1939)" screen. The previously active J1939 diagnosis trouble codes are displayed here.
SPN = Suspect Parameter Number
FMI = Failure Mode Indicator
OC = Occurrence Count

- Return to "Engine (J1939)" screen.
- Scroll up display screen.
- Scroll down display screen.

Screen "Mains" **[all application modes]**



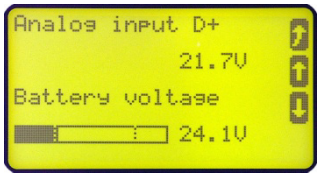
This screen appears after pressing the "Mains" softkey in the "Measured values" screen. All measured generator values are displayed in this screen.

- Return to "Measured values" screen.
- Scroll down display screen to additional mains values.
- Scroll up display screen to main mains values.
- Reset the maximum value display.

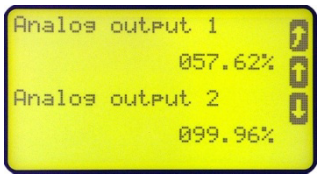
V ..... Voltage
A ..... Current
kW .... Real power
kvar .. Reactive power

Screen "Analog inputs/outputs" **[all application modes]**

"Analog inputs" screen:



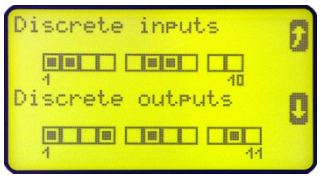
"Analog outputs" screen:

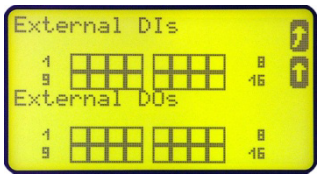


These screens appear after pressing the "Analog inputs/outputs" softkey in the "Measured values" screen. The analog inputs and outputs are displayed. The analog outputs are displayed as a percentage of the selected hardware range, i.e. 50 % of a 0 to 20 mA output refer to 10 mA.

- Return to "Measured Values" screen.
- Scroll up display screen.
- Scroll down display screen.

Screen "Discrete inputs/outputs" **[all application modes]**





This screen appears after pressing the "Discrete inputs/outputs" softkey in the "Measured values" screen. Discrete input and discrete output status are displayed.

Return to "Measured Values" screen.

Scroll down to external DIs/DOs.

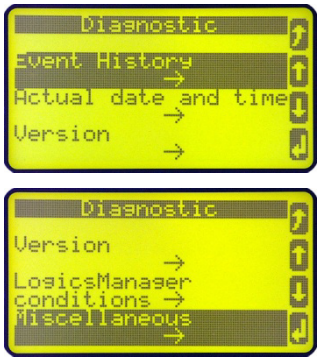
Scroll up to discrete inputs/outputs.

Status display of the discrete inputs and discrete outputs. (Note: The configured logic for the discrete input "N.O./N.C." will determine how the easYgen reacts to the state of the discrete input. If the respective DI is configured to N.O, the unit reacts on the energized state ( ); if it is configured to N.C., it reacts on the de-energized state ( ).

Discrete input: energized
de-energized

Discrete output: relay activated
relay de-activated

Screen "Diagnostic" **[all application modes]**



This screen appears after pressing the "Diagnostic" softkey in the "Main menu" screen.

Return to the "Main menu" screen.

Scroll up to next menu item.

Scroll down to next menu item.

Enter menu item.

LogicsManager conditions
Display the LogicsManager conditions screen.
Actual date and time
Display the actual date and time screen.
Version
Display the version screen.
Event History
Display the event history screen.
Miscellaneous
Display the miscellaneous screen.

Screen "LogicsManager conditions" **[all application modes]**

Command variables of group 3 (ex.):

This screen appears after pressing the "LogicsManager conditions" softkey in the "Diagnostic" screen. You are able to display the conditions of all *LogicsManager* command variables, which are located in their respective groups.

Return to "Diagnostic" screen.

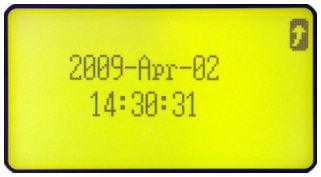
Scroll up one group / command variable.
Scroll down one group / command variable.

Select the highlighted command variable group and display the state of the command variables in this group.

Status display of the command variables:

The command variables is TRUE
The command variables is FALSE

Screen "Actual date and time" **[all application modes]**

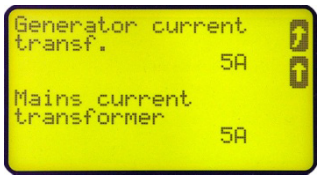


This screen appears after pressing the "Actual date and time" softkey in the "Diagnostic" screen. This screen displays the actual date and time.

Return to "Diagnostic" screen.

xxxx-yyy-zz - Date
xxxx = Year
yyy = Month
zz = Day
xx:yy:zz - Time
xx = Hour
yy = Minute
zz = Second

Screen "Version" **[all application modes]**



This screen appears after pressing the "Version" softkey in the "Diagnostic" screen. This screen displays the serial number of the unit and the firm- and software P/N, version, and revision.

Return to "Diagnostic" screen.

Scroll down display screen.
Scroll up display screen.

Screen "Event History" **[all application modes]**

This screen appears after pressing the "Event History" softkey in the "Diagnostic" screen. A date/time stamp is added to each entry. Additional characters (+ and -) indicate the state of the event. The "+" character indicates an condition that is still active. If the condition is no longer present anymore, it will be displayed again, but with a "-" indication.

Return to "Diagnostic" screen.

Scroll up one event.
Scroll down one event.

Screen "Miscellaneous" **[all application modes]**

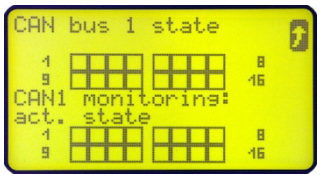
This screen appears after pressing the "Miscellaneous" softkey in the "Diagnostic" screen.

Return to "Diagnostic" screen.

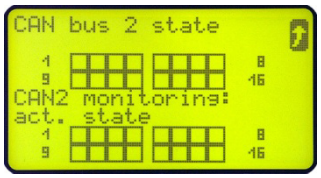
Scroll up to next menu item.
Scroll down to next menu item.
Enter menu item.

Screen "CAN interface 1/2 state" **[all application modes]**

CAN interface 1 state:



CAN interface 2 state:



This screen appears after selecting "CAN interface 1/2 state" in the "Miscellaneous" screen.

Return to "Miscellaneous" screen.

Status display of the respective bits:

The respective bit is enabled
The respective bit is disabled

Can bus 1 state:
- Bit 1 a TPDO has incorrect mapping parameters
- Bit 2 an RPDO has incorrect mapping parameters
- Bit 3 a TPDO has more than 8 bytes
- Bit 4 an RPDO has more than 8 bytes

CAN 1 monitoring (active state):
- Bit {x} RPDO{x} is not received at the moment

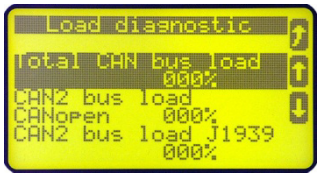
CAN 1 monitoring (latched state):
- Bit {x} RPDO{x} has not been received

Can bus 2 state:
- Bit 13 one Node ID is assigned to more than 1 device

CAN 2 monitoring (active state):
- Bit {x} CAN Node ID {x} is not received at the moment

CAN 2 monitoring (latched state):
- Bit {x} CAN Node ID {x} has not been received

Screen "Load diagnostic" **[all application modes]**



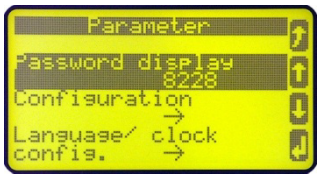
This screen appears after selecting "Load diagnostic" in the "Miscellaneous" screen and displays the total CAN bus load as well as the load on the individual CAN busses.

Return to "Miscellaneous" screen.

Scroll up to next menu item.

Scroll down to next menu item.

Screen "Parameter" **[all application modes]**



This screen appears after pressing the softkey in the starting screen.

- Return to the starting screen.
- Scroll up to next menu item.
- Scroll down to next menu item.
- Enter menu item.

Code level display
Displays the code level.
Configuration
Display the configuration menu screen.
Language / clock configuration
Display the language / clock configuration.
Display configuration
Display the display configuration.
Enter password
Display the password entry screen.
System management
Display the system management configuration screen.

Screen "Configuration" **[all application modes]**

This screen appears after pressing the "Configuration" softkey in the "Parameter" screen.

- Return to the "Parameter" screen.
- Scroll up to next menu item.
- Scroll down to next menu item.
- Enter menu item.

Application configuration
Display the application configuration screen.
Monitoring configuration
Display the monitoring configuration screen.
Measurement configuration
Display the measurement configuration screen.
Interfaces configuration
Display the interfaces configuration screen.
Configure LogicsManager
Display the *LogicsManager* configuration screen.
Counters configuration
Display the counter configuration screen.

Screen "Language / clock configuration" **[all application modes]**

This screen appears after pressing the "Language / clock configuration" softkey in the "Parameter" screen.

Return to the "Parameter" screen.

Scroll up one parameter.
Scroll down one parameter.
Select the parameter to be configured with this softkey. Change the parameter using the softkey. Confirm the change with the softkey or exit parameter configuration without any changes using the softkey.

Screen "Display configuration" **[all application modes]**

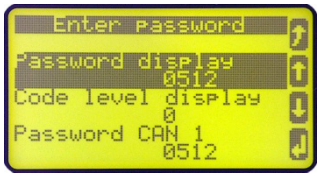
This screen appears after pressing the "Display configuration" softkey in the "Parameter" screen. The contrast and brightness of the display may be configured here.

Return to the "Parameter" screen.

Increase contrast/brightness.
Decrease contrast/brightness.
Lamp test

Pressing and holding the STOP button for at least 10 seconds restores the default settings for contrast and brightness in case the settings have been adjusted in a way that the display can't be read anymore.

Screen "Enter password" **[all application modes]**



This screen appears after pressing the "Enter password" softkey in the "Parameter" screen. Only the password may be entered using this screen. The code levels are only displayed depending on the entered password.

Return to the "Parameter" screen.

Scroll up one parameter.
Scroll down one parameter.
Select the parameter to be configured with this button. Change the parameter using the softkey. Confirm the change with the softkey or exit parameter configuration without any changes using the softkey.

Screen "System management" **[all application modes]**

This screen appears after pressing the "System management" softkey in the "Parameter" screen.
You may find a detailed structure of the configuration screens in the Configuration section starting on page 38.

Return to the "Parameter" screen.

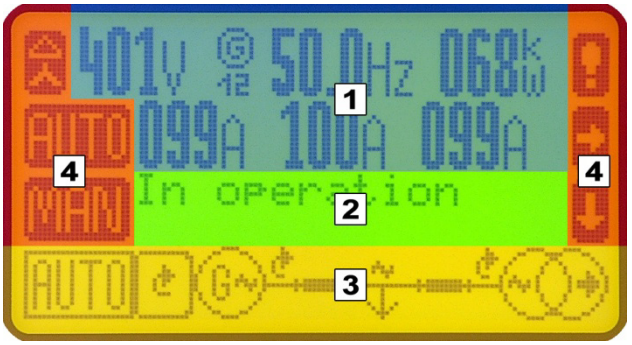
Scroll up one parameter.

Scroll down one parameter.

Select the parameter to be configured with this button. Change the parameter using the softkey. Confirm the change with the softkey or exit parameter configuration without any changes using the softkey.

Operation

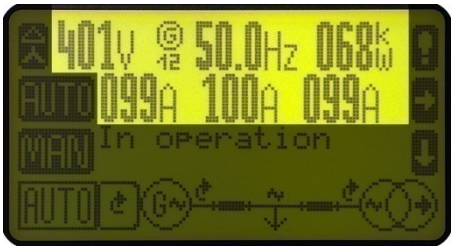
The display is partitioned into different areas to give an overview of the displayed data.



1. Values
2. Operation State & Alarm Message
3. Operation
4. Softkeys

Figure 2-2: Screen - Level overview

"Values"

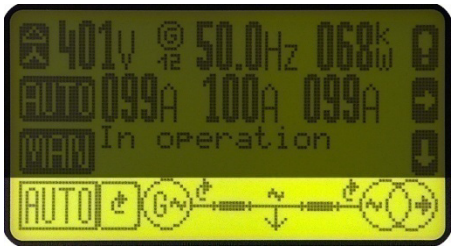


The "values" section of the screen illustrates all measured power related information including voltages, currents, frequencies, power, and power factor values.

"Operation state & Alarm message"

The "operation state & alarm message" section of the screen shows the actual operating information. Refer to Appendix A: Status Messages on page 43 for a list of all operation states and Appendix A: Alarm Messages on page 45 for a list of all alarm messages.

"Operation"



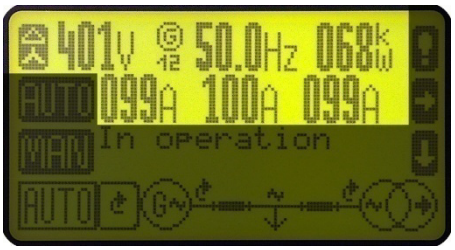
The "operation" section of the screen has a single-line diagram of the system application showing current status of the engine and power circuit breakers. This level is also used for manual operation of the genset.

"Softkeys"

The softkey characters permit navigation between screens, levels and functions as well as configuration and operation.

Display

Softkey "Voltage display"



The voltage display softkey changes the type of voltage display. The amount of information available from the system depends on how the measuring is configured in the control. Table 2-1 illustrates what values are available depending on the configured measurement type.

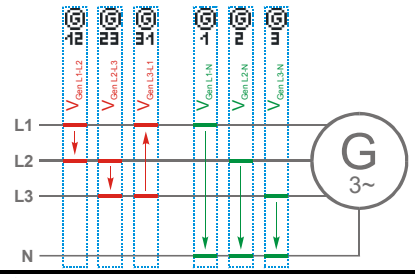
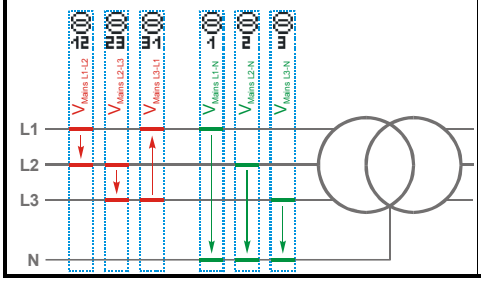
Measuring point	Scroll display Soft key	Press	Symbol of the displayed voltage			Displayed at parameter setting 3Ph 4W	3Ph 3W	1Ph 2W	1Ph 3W
Generator 		0× (6×)	G 12	Delta	L1-L2	yes	yes	---	---
		1×	G 23	Delta	L2-L3	yes	yes	---	---
		2×	G 31	Delta	L3-L1	yes	yes	---	yes
		3×	G 1	Wye	L1-N	yes	---	yes	yes
		4×	G 2	Wye	L2-N	yes	---	---	---
		5×	G 3	Wye	L3-N	yes	---	---	yes
Mains 		0× (6×)	M 12	Delta	L1-L2	yes	yes	---	---
		1×	M 23	Delta	L2-L3	yes	yes	---	---
		2×	M 31	Delta	L3-L1	yes	yes	---	yes
		3×	M 1	Wye	L1-N	yes	---	yes	yes
		4×	M 2	Wye	L2-N	yes	---	---	---
		5×	M 3	Wye	L3-N	yes	---	---	yes

Table 2-1: Display - Measuring values

Mode

Softkeys "Mode"

By pressing the softkeys "AUTO Mode", "MAN Mode" or the button "STOP", the operating mode is selected. Depending on the application mode selected, different softkeys are enabled or disabled in the display. The active operation mode is displayed left of the engine symbol. If the operation mode STOP is selected, the LED next to the push button is illuminated in addition to the mode being displayed left of the engine symbol.

Note: If the control unit has been configured for external operating mode selection, the AUTO and MAN Mode softkeys are not displayed and the STOP push button is disabled. The operating mode cannot be changed.

STOP Operating mode

When STOP is selected, the engine is stopped. The STOP mode is indicated in the lower left corner of the display by the STOP symbol.

AUTOMATIC Operating mode

When AUTOMATIC is selected, the control unit manages all engine start/stop and breaker control functions. These functions are performed in accordance with how the control is configured. The AUTOMATIC mode is indicated in the lower left corner of the display by the AUTO symbol.

MANUAL Operating mode

When MANUAL is selected, all engine and breaker control is performed manually via the softkeys along the bottom of the display. The MANUAL mode is indicated in the lower left corner of the display by the MAN symbol.

Operation

Softkeys "Manual Mode"

If the unit is in the MANUAL operating mode (the MAN symbol is displayed in the lower left corner), the softkeys are enabled for manual operation of the engine and the power circuit breakers. The symbols "0" and "1" indicate if a start/stop command is being processed at the moment. The arrows on the breaker symbol indicate if an open/close command is being processed at the moment. The G symbol indicates that the engine delayed monitoring has expired and the monitoring functions are enabled. The symbol indicates that power is detected at the respective measuring point (generator, busbar, or mains). The direction of the circular arrow indicates, if the generator or mains rotating field is clockwise (CW) or counter-clockwise (CCW). The arrow symbol at the mains interchange point indicates whether power is exported ( ) or imported ( ).

Engine Start/Stop

Starting process: By pressing this softkey the engine is started.
- Successful: If the starting process was successful, the circular arrow indicates that speed is detected and the engine is running. The G symbol indicates that the engine delayed monitoring has expired and the monitoring functions are enabled.
- Unsuccessful: No change in the display until the start failure message appears.

Stop process: Pressing the softkey again will stop the engine.
- Successful: If the stop process was successful, the circular arrow and the G symbol disappear.
- Unsuccessful: No change in the display until the stop failure message appears.

Power circuit breaker open/close (GCB/MCB)

Close: By pressing the softkey under the desired circuit breaker, it is closed.
- Successful: If the closing process was successful, the breaker symbol turns horizontal.
- Unsuccessful: If the closing process was not successful, the breaker symbol remains vertical.

Open: To open this breaker this softkey is pressed while the breaker symbol is horizontal. The arrows and the "Open GCB/MCB" messages indicate the open command.
- Successful: If the opening process was successful, the breaker symbol turns vertical.
- Unsuccessful: If the opening process was not successful, the breaker symbol remains horizontal and the arrows will remain within the softkey character until the control is able to open the breaker.

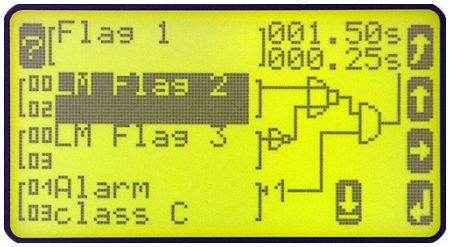
CAUTION

The breakers will open immediately without power reduction. If you want to open the breaker in a no-load condition, you must reduce the load manually in the set point screen.

LogicsManager

Some parameters of the easYgen are configured via the *LogicsManager* (refer to Configuration Manual 37427). A typical *LogicsManager* screen is shown in the following. You may configure a logical operation using various command variables, signs, logical operators, and delay times to achieve the desired logical output.

LogicsManager Screen



For configuration of the *LogicsManager* the softkeys displayed in the right and bottom section are used. The softkey on the upper left opens a help screen. The softkeys are assigned with different functions.
Two delays may also be configured for the output:
(Delay ON): delay before output becomes TRUE
(Delay OFF): delay before output becomes FALSE

Leave current screen ("Escape" / "ESC")

By pressing this softkey character you exit and go to the previous screen. If the Escape key is used to leave a *LogicsManager* configuration screen, any unconfirmed changes made will not be stored.

Select parameter

By pressing these softkey characters you may select the *LogicsManager* parameter to be configured.

Confirm selection

By pressing this softkey character you confirm the configured option of the selected *LogicsManager* parameter.

Change option

By pressing these softkey characters you may change the option of the selected *LogicsManager* parameter upwards or downwards.

Change variable group/cursor position

Command variable selection field:
By pressing this softkey character you may change the command variable group. The command variables within a group may be changed using the  softkey.
Time delay configuration field:
By pressing this softkey character you may change the cursor position. The selected digit may be changed using the  softkey.

Help button

By pressing this softkey character you get to a help screen, which displays the logical operators of the *LogicsManager*. You may return to the *LogicsManager* with the Escape softkey  .

Chapter 3.
Functional Description

Overview

	Application Mode							
	{0}		{1o}		{1oc}		{2oc}	
Operation Mode	MAN	AUTO	MAN	AUTO	MAN	AUTO	MAN	AUTO
Operate the engine								
• Start engine by:								
the engine push button (Softkey)	YES	---	YES	---	YES	---	YES	---
the discrete inputs	---	YES	---	YES	---	YES	---	YES
emergency power (AMF)	---	---	---	---	---	---	---	YES
the interface	---	YES	---	YES	---	YES	---	YES
• Stop engine by:								
the STOP push button	YES	YES	YES	YES	YES	YES	YES	YES
the engine push button (Softkey)	YES	---	YES	---	YES	---	YES	---
emergency power (AMF)	---	---	---	---	---	---	---	YES
the *LogicsManager*	---	YES	---	YES	---	YES	---	YES
an alarm (i.e. overspeed lvl 2)	YES	YES	YES	YES	YES	YES	YES	YES
Operate GCB								
• close GCB								
the GCB push button (Softkey)	---	---	---	---	YES	---	YES	---
emergency power (AMF)	---	---	---	---	---	---	---	YES
the *LogicsManager*	---	---	---	---	---	YES	---	YES
• open GCB								
the STOP push button	YES	YES	YES	YES	YES	YES	YES	YES
the GCB push button (Softkey)	---	---	YES	---	YES	---	YES	---
the *LogicsManager*	---	---	---	YES	---	YES	---	YES
an alarm (i.e. overvoltage)	---	---	YES	YES	YES	YES	YES	YES
Operate MCB								
• open MCB								
the MCB push button (Softkey)	---	---	---	---	---	---	YES	---
emergency power (AMF)	---	---	---	---	---	---	---	YES
the *LogicsManager*	---	---	---	---	---	---	---	YES
• close MCB								
the MCB push button (Softkey)	---	---	---	---	---	---	YES	---
the *LogicsManager*	---	---	---	---	---	---	---	YES

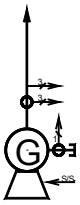
Table 3-1: Functional description - Overview

- **Application Mode** (page 33): depends on the application; defines the number/function of the breakers ({0}, {1o}, {1oc}, {2oc}).
- **Operating Mode** (page 34): depends on the application; separates between STOP, MANUAL and AUTOMATIC.

Application Modes

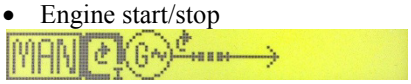
The application mode may be changed only during configuration with the code level CL2 or higher password. The most important features of the four application modes are illustrated in the following section. A description of the functions that are possible during each application mode can be found in the Configuration Manual (parameter 3401, manual 37427). Table 3-1: Functional description - Overview describes which function is available in each application mode.

Application Mode {0} – Start/Stop



This application mode provides the following functions:

- Measuring of engine/generator parameters (i.e. voltage, frequency, current, power, coolant temperature, oil pressure, etc.)
- Engine start/stop

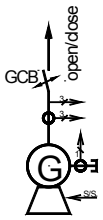


Application Mode {1o} – Open GCB

This application mode provides the following functions:

- Measuring of engine/generator parameters (i.e. voltage, frequency, current, power, coolant temperature, oil pressure, etc.)
- Engine start/stop
- Engine/generator protection (relay output to open GCB)

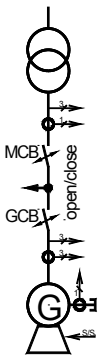
Application Mode {1oc} – Open/Close GCB



This application mode provides the following functions:

- Measuring of engine/generator parameters (i.e. voltage, frequency, current, power, coolant temperature, oil pressure, etc.)
- Engine start/stop
- Engine/generator protection (relay output to open GCB)
- GCB operation (relay output to close GCB)

Application Mode {2oc} – Open/Close GCB/MCB



This application mode provides the following functions:

- Measuring of engine/generator parameters (i.e. voltage, frequency, current, power, coolant temperature, oil pressure, etc.)
- Engine start/stop
- Engine/generator protection (relay output to open GCB)
- GCB operation (relay output to close GCB)
- MCB operation (relay output to open and close the MCB)
- Mains failure detection (AMF auto mains failure operation) and automatic engine start/stop

Operating Modes

Operating Mode STOP

NOTE

Selecting the operating mode STOP is not the same as an EMERGENCY STOP. In some cases the easYgen will perform additional logic functions, such as an engine cool down period, before the engine is stopped. It is recommended that an EMERGENCY STOP discrete input be utilized and programmed as an F class alarm.

In the STOP operating mode neither the engine nor the GCB can be operated. Dependent on the application mode the power circuit breakers cannot be operated. If the operating mode STOP has been selected while

the engine was already stopped

- The GCB will not be closed
- The fuel solenoid relay will not be enabled
- The discrete inputs and bus commands are ignored
- The start push buttons (softkeys) are disabled (depending on the previous operating mode)
- The engine/generator monitoring remains de-activated (exception: all monitoring that is not delayed by the engine speed monitoring)

the engine was running

- The GCB is opened
  Requirements:
  - The easYgen is at least in application mode {1o} and
  - the GCB is closed
- The MCB will be closed
  Requirements:
  - The easYgen is at least in application mode {2oc}
  - the GCB is open
  - the MCB is enabled
- An engine cool down will be performed (the STOP LED is flashing)
- The fuel solenoid relay will be disabled
- The engine/generator monitoring will be de-activated (exception: all monitoring that is delayed by the engine speed monitoring)
- The control unit screen will display the operations as they are performed

the engine performs a cool down

- Pressing the STOP button again causes an immediate stop of the cool down and stops the engine

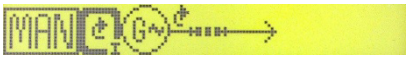
NOTE

If the conditions of the *LogicsManager* function "Enable MCB" (parameter 12923) are TRUE, the MCB will be closed again if it is open in STOP operating mode.

Operating Mode MANUAL

In the MANUAL operating mode (softkey “MAN") the engine and the power circuit breakers are operated via the push buttons along the bottom of the display (softkeys). All elements that may be operated via the softkeys have a black frame. All other elements cannot be operated. The single line diagram in the lowest line will change according to the application mode.

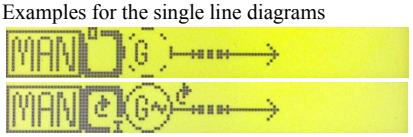
The single line diagrams are displayed as follows:



Single line diagram for application mode {0}.
When MANUAL operating mode is selected a black frame softkey character will appear around the engine to indicate that the push buttons below this softkey character may be used to start and stop the engine. This is shown below highlighted for the following functions.

- Start the engine
- Stop the engine

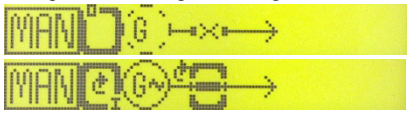
Examples for the single line diagrams



Single line diagram for application mode {1o}.
For a {1o} application both the engine and the GCB softkey characters appear with the following functions. The "X" symbol indicates that a breaker open command is issued or a closure of the breaker is blocked. The dotted breaker line indicates no defined breaker state.

- Start the engine
- Stop the engine
- Open the GCB

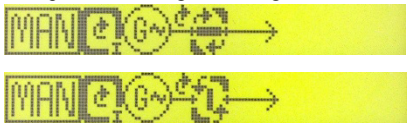
Examples for the single line diagrams



Single line diagram for application mode {1oc}.
For a {1oc} application both the engine and the GCB softkey characters appear with the following functions.

- Start the engine
- Stop the engine
- Open the GCB
- Close the GCB

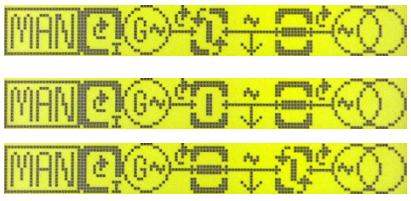
Examples for the single line diagrams



Single line diagram for application mode {2oc}.
For a {2oc} application both the engine, the GCB and the MCB softkey characters appear with the following functions.

- Start the engine
- Stop the engine
- Open the GCB
- Close the GCB
- Open the MCB
- Close the MCB

Examples for the single line diagrams



Operating Mode AUTOMATIC

In the AUTOMATIC operating mode, all engine, GCB, and/or MCB functions are operated via an interface, or automatically by the control unit (i.e. a mains failure). The function of the easYgen depends on the configuration of the unit and how the external signals are used. The start /stop sequence of the engine is described in more detail in manual 37427.

In the following text the main functions are briefly described.

Start engine

Remote start
The engine is started via a remote start signal.

A Start in Auto requires.

- The AUTOMATIC operating mode is enabled.
- The function "Start req. in AUTO" is assigned via the *LogicsManager* to a discrete input and the conditions are fulfilled (TRUE).
- This discrete input or a start via interface is energized (logically HIGH signal) or the necessary command of the interface protocol is set (for explanation of the interface protocol refer to the interface manual 37430).
- A class C alarm or higher is not present (for explanation of the alarm classes refer to manual 37427).
- The engine is ready for operation.
- The GCB is open.

Mains fault

AMF / Auto mains failure operation (only in application mode {2oc})
If the AUTOMATIC operating mode is enabled and the application mode is configured to {2oc} (2-breaker logic) and the mains fail, the engine and the power circuit breakers will be operated according to the conditions in the following table.

An AMF start requires.

- The AUTOMATIC operating mode is enabled.
- The application mode is configured as {2oc}.
- The parameter "Emergency power" is configured as ON.
- The configured mains failure limits are reached.
- The configured delay times have expired.
- A class C alarm or higher is not present (for explanation of the alarm classes refer to 37427).
- The engine is ready for operation.

Status (prior to mains failure)			**Action** (order)		
Engine	**GCB**	**MCB**	**Engine**	**GCB**	**MCB**
0 (stopped)	**0** (open)	**0** (open)	**1** (start)	**2** (close)	---
	0 (open)	**1** (closed)	**1** (start)	**3** (close)	**2** (open)
1 (running)	**0** (open)	**0** (open)	---	**1** (close)	---
	0 (open)	**1** (closed)	---	**2** (close)	**1** (open)
	1 (closed)	**0** (open)	---	---	---
Mains decoupling GCB:	**1** (closed)	**1** (closed)	---	**1** (open) **3** (close)	**2** (open)
Mains decoupling MCB:	**1** (closed)	**1** (closed)	---	(remains closed)	**1** (open)

Table 3-2: Functional description - AMF conditions

Functional description of AMF conditions:

- If the engine is not running prior to a mains failure and both, the GCB and MCB are open, the following actions occur:
  1. The engine starts
  2. The GCB closes
  3. The load is supplied by the generator set

- If the engine is not running prior to a mains failure, the GCB is open, and the MCB is closed the following actions occur:
  1. The engine starts
  2. The MCB opens
  3. The GCB closes
  4. The load is supplied by the generator set

- If the engine is running prior to a mains failure, the GCB is open, and the MCB is open the following actions occur:
  1. The GCB closes
  2. The load is supplied by the generator set

- If the engine is running prior to a mains failure, the GCB is open, and the MCB is closed the following actions occur:
  1. The MCB opens
  2. The GCB closes
  3. The load is supplied by the generator set

- If the engine is running prior to a mains failure, the GCB is closed, and the MCB is open the following actions occur:
  1. The generator set continues to supply the load

- If the genset is operating in parallel with the mains prior to a mains failure, both breakers are closed, the following actions occur:
  1. A mains decoupling will be performed and the GCB or MCB will be opened depending on the configuration of the mains decoupling function:
     - Mains decoupling configured to MCB or MCB->GCB:
       a. The MCB opens
       b. The GCB remains closed
       c. The engine keeps running
     - Mains decoupling configured to GCB or GCB->MCB:
       a. The GCB opens
       b. The MCB opens after the delay time
       c. The GCB closes
       d. The engine keeps running
  2. The load is supplied by the generator set

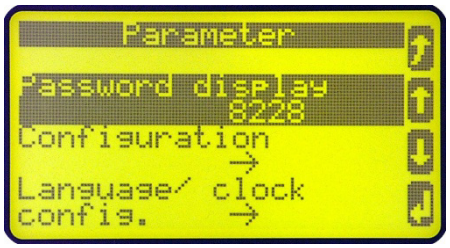
Chapter 4.
Configuration

This chapter provides information "how to configure the unit via the LC display" as well as the description of all parameters that may be changed without a password. If you have the correct codes to configure the unit (this is verified via passwords), refer to manual 37427 for a description of all parameters, their setting range, and their influence to the operation of the unit.

Access configuration menus

By pressing the softkey, the Parameter menu will be displayed to permit configuration of the control unit. The different configuration screens may be displayed by selecting the respective softkey.

Softkeys "Configuration - Enter password"



Navigation through the parameters is carried out using the softkeys and . To edit the selected parameter press . To save the edited parameter press . To exit the parameter without saving any changes press .

Return to the previsous screen/exit parameter without saving changes ("Escape")

Navigate..... Pressing the softkey will return the operator to the previous display screen.
Edit ..... If it is desired to exit a parameter without saving changes made there, press the softkey and the user will be returned to the previous screen.

Next parameter

This softkey permits the user to navigate down through the parameters. Only the parameters assigned by the active password will be displayed. The parameters that may only be accessed after entering a password are described in the Configuration Manual 37427. If an Asian language is configured, some parameter screens may be displayed with an empty space at the bottom of the parameter list, which may be interpreted as an end of the list, although more parameters exist and are displayed when scrolling down.

Previous parameter

This softkey permits the user to navigate upwards through the parameters.

Decrease/change function

If the desired parameter has been selected by pressing the softkey, and the cursor has been moved to the appropriate position via the softkey, the value of the digit may be decreased by one using the softkey.

Increase/change function

If the desired parameter has been selected by pressing the softkey, and the cursor has been moved to the appropriate position via the softkey, the value of the digit may be increased by one using the softkey.

Select parameter/input confirmation ("Enter")

Navigate.....A highlighted parameter may be entered for configuration by pressing the softkey. This permits the changing of the configured value within the parameter.

Edit.....Any value that has been changed within a parameter is changed and stored in the unit memory by pressing the softkey.

Next digit of the selected parameter

If the parameter has a numeric value (i.e. the password) that is to be changed, the digits must be changed individually. The softkey permits navigation to each cursor position of the number to be changed. See the softkey symbols and for an explanation of how to change the digit.

Parameters

NOTE

A description of all parameters, which may be edited/configured via the display, are described in the Configuration Manual 37427.

Language

EN	Language	**Change language** **{Language}**
DE	Language	

{Language} . The selection of a language will affect the following text in the control unit:

- Text in the operating field which are not defined by an input (i.e. discrete inputs may be a user-defined text)
- The alarm list and event history texts
- All parameters which may be changed via the unit panel

NOTE

Refer to Appendix B: Restoring a Language Setting on page 51 if your unit is configured to a language you are not able to read or understand.

Real-Time Clock - Time

EN	Hour	**Adjust clock time: hour** **0 to 23**
DE	Stunden	

The hour of the current time is set here. Example:
0 ..... 0th hour of the day.
23 ..... 23rd hour of the day.

EN	Minute	**Adjust clock time: minute** **0 to 59**
DE	Minuten	

The minute of the current time is set here. Example:
0 ..... 0th minute of the hour.
59 ..... 59th minute of the hour.

EN	Second	**Adjust clock time: second** **0 to 59**
DE	Sekunden	

The second of the current time is set here. Example:
0 ..... 0th second of the minute.
59 ..... 59th second of the minute.

Real-Time Clock - Date

EN Day
DE Tag

Adjust date: day **1 to 31**

The day of the current date is set here. Example:
1.....1st day of the month.
31.....31st day of the month.

EN Month
DE Monat

Adjust date: month **1 to 12**

The month of the current date is set here. Example:
1.....1st month of the year.
12.....12th month of the year.

EN Year
DE Jahr

Adjust date: year **0 to 99**

The year of the current date is set here. Example:
0.....Year 2000.
99.....Year 2099.

Display Contrast

EN Configure display
DE Display konfig.

Configure display **+ / -**

In the "Configure display" screen, the display contrast and brightness may be increased or decrease using these softkey characters.

 .....Increase the display contrast/brightness.
 .....Decrease the display contrast/brightness.

.....If the display contrast and/or brightness has been decreased to the point that it is no longer visible, press and hold the STOP button for at least 10 seconds. This will restore the contrast and brightness to the factory default setting.

Password

EN Password display
DE Passwort Display

Password for access via the unit panel **0000 to 9999**

A password must be entered to permit configuration of the unit via the unit panel. If a password is not entered only the displayed parameters may be edited.

EN Code level display
DE Codeebene Display

Code level via display **Info**

This value displays the code level that is currently active for access via the front panel.

EN Password for CAN interface {x}
DE Passwort CAN Schnittstelle {x}

Password for access via CAN interface {x} **0000 to 9999**

A password must be entered to permit configuration of the unit via CAN interface {x}. If a password is not entered, the displayed parameters may not be edited.

EN Code level CAN interface {x}
DE Codeebene CAN Schnittstelle {x}

Code level CAN-Bus {x} **Info**

This value displays the code level that is currently active for access via the CAN bus.

EN Password for serial interface{x}
DE Passwort serielle Schnittst. {x}

Password for access via serial interface {x} **0000 to 9999**

A password must be entered to permit configuration of the unit via serial interface {x}. If a password is not entered, the displayed parameters may not be edited.

EN Code level serial interface {x}
DE Codebene serielle Schnittst. {x}

Code level serial port {x} **Info**

This value displays the code level that is currently active for access via the serial interface {x}.

Deactivate Horn

EN Time until horn reset
DE Zeit Hupenreset

Self acknowledgement of the horn signal **0 to 1.000 s**

A horn signal is issued and the alarm LED flashes when a fault condition occurs. This signal will be disabled when the configured time expires. This is the maximum time, for which a horn signal is active (it will also be deactivated if it is acknowledged before).

Factory (Default) Values

EN Factory settings
DE Werkseinstellung

Factory setting **YES/NO**

The factory settings (default values) may be loaded. Select YES to enable the following parameter to be displayed. It is possible to load the factory settings (default values) for all parameters, which are accessible in the currently active code level.

EN Set default values
DE Standardwerte wiederherstellen

Set default values **YES/NO**

Entering YES overwrites the current configured values with the default values. Only those parameters will be reset, which are permitted to change in the selected code level.

Appendix A.
Display Messages

Status Messages

Message text and ID	Meaning
AUTO mode ready **ID 13253**	**Automatic mode ready for start** The unit is waiting for a start signal in Automatic operating mode and no alarm of class C, D, E, or F is present.
Aux. serv. postrun **ID 13201**	**Postrun of the auxiliary operation is active** After the engine has stopped, auxiliary operations are enabled. These operations ensure that required equipment which is necessary for the operation of the engine continues to run (i.e. electric cooling fan).
Aux. services prerun **ID 13200**	**Prerun of the auxiliary operation is active** Before the engine is started the signal "aux. services prerun" is enabled, so that all required equipment which is necessary for the operation of the engine can be initialized, started or switched.
Cool down **ID 13204**	**Coasting of the engine is active** The no load operation is performed prior to the stopping of the engine. The no load operation is utilized to cool the engine.
Crank protect **ID 13214**	**Starter protection** To prevent the starter from being damaged by an engine that is rotating, a crank protection delay is active to ensure that the engine has time to stop rotating.
Critical mode **ID 13202**	**Critical mode (Sprinkler operation) is active** The sprinkler operation is activated. The exact description of the conditions and effects of the sprinkler operation are described in the configuration manual 37427.
Emergency/Critical **ID 13215**	**Emergency operation during active critical operation** {2oc} Critical operation and emergency run is activated.
Emergency run **ID 13211**	**Emergency power operation** {2oc} After the control unit detects that a mains fault has occurred, the engine is started after the emergency delay timer expires. The MCB is opened, the GCB is closed, and the generator set assumes the load. If the generator set is already running, operations continue until the emergency power operation conditions no longer exist. If the mains return, the mains settling timer becomes active first (see below).
GCB dead bus close **ID 13209**	**Dead bus closing of the GCB** {1oc}, {2oc} The GCB is closed onto the de-energized busbar. The measured busbar voltage is below the configured dead bus detection limit.
GCB -> MCB Delay **ID 13261**	**GCB – MCB delay time is active** {2oc} If the breaker logic is configured to Open Transition and a transfer from generator to mains supply is initiated, the transfer time delay will start after the replay "GCB is open" is received. The MCB close command will be issued after the transfer time has expired.
GCB open **ID 13255**	**The GCB is being opened** {1oc}, {2oc} A GCB open command has been issued.
Gen. stable time **ID 13250**	**Generator stable time is active** If the engine monitoring delay timer has expired, the generator settling time starts. This permits for an additional delay time before the breaker is closed in order to ensure that none of the engine delayed watchdogs trips.
Idle run active **ID 13216**	**The control is in idle mode** No undervoltage, underfrequency, and underspeed monitoring is performed in idle mode. The flexible limits 13 through 16 are not monitored.

Message text and ID	Meaning
Ignition **ID 13213**	**Enable the ignition** {Gas engine} After the purging operation and before the fuel solenoid is opened.
In operation **ID 13251**	**The genset is in regular operation** The genset is in regular operation and is ready for supplying load.
Loading Generator **ID 13258**	**The generator power will be increased to the set point** The generator power will be increased to the configured set point with a rate defined by the power control set point ramp.
Mains settling **ID 13205**	**Mains settling time is active** {2oc} When the control unit detects that the mains fault is no longer present and power has been restored, the mains settling timer begins counting down. If the mains are stable after the expiration of the timer (the mains voltage has not fallen below or risen over the configured monitoring limits), the load is transferred from the generator supply to the mains supply.
MCB dead bus close **ID 13210**	**Dead bus closing of the MCB** {2oc} The MCB is closed onto the de-energized busbar. The measured busbar voltage is below the configured dead bus detection limit.
MCB -> GCB Delay **ID 13262**	**MCB – GCB delay time is active** {2oc} If the breaker logic is configured to Open Transition and a transfer from mains to generator supply is initiated, the transfer time delay will start after the reply "MCB is open" is received. The GCB close command will be issued after the transfer time has expired.
MCB open **ID 13257**	**The MCB is being opened** {2oc} An MCB open command has been issued.
Power limited prerun **ID 13252**	**Active power limited prerun is active** The real power set point is limited to the warm up power limit for the configured warm up time.
Preglow **ID 13208**	**Preglow of the engine is active** {Diesel engine} The diesel engine is preheated prior to starting.
Ramp to rated **ID 13254**	**Engine is accelerating to rated speed** After firing speed has been exceeded, the engine monitoring delay timer starts. This message is displayed during this period.
Start **ID 13206**	**Start engine is active** After the "Prerun auxiliary operation" expires, the engine is started according to the configured start logic (Diesel or gas engine). When the start sequence is active, various relays are enabled and representative signals are passed via the CAN bus to a secondary engine control.
Start – Pause **ID 13207**	**Start pause while starting the engine is active** If the engine could not be started, the controller will pause for the configured time prior to attempting to issuing a start command again.
Start w/o Load **ID 13263**	**Start without load is active** A regular engine start is performed. The GCB operation is blocked to prevent a change from mains to generator supply.
Stop engine **ID 13203**	**Engine will be stopped** The engine will be stopped. The engine stop delay will be started when ignition speed has been fallen below. A restart is only possible if the engine stop delay has been expired.
Synchronization GCB **ID 13259**	**The GCB will be synchronized** The control tries to synchronize the GCB.
Synchronization MCB **ID 13260**	**The MCB will be synchronized** The control tries to synchronize the MCB.
Turning **ID 13212**	**Purging operation is active** {Gas engine} Before the fuel solenoid opens and the ignition of the gas engine is energized the remaining fuel, that may be present in the combustion chamber, will be removed by a purging operation. The starter turns the engine without enabling the ignition for a specified time to complete the purging operation. After the purging process, the ignition is energized.
Unloading Generator **ID 13256**	**The generator power will be decreased** The generator power will be decreased after a stop command has been issued with a rate defined by the power control set point ramp before the GCB will be opened.
Unloading mains **ID 13264**	**The mains power will be decreased** The real power set point is increased with the configured rate after synchronizing the generator in interchange transition mode. After the mains have been unloaded, the MCB will be opened.

Alarm Messages

NOTE

Refer to the Configure Monitoring section of the Parameters chapter in the Configuration Manual 37427 for a detailed description of the monitoring functions, which trigger the alarm messages.

Message text and ID	Meaning
Amber warning lamp **ID 15126**	**Amber warning lamp, J1939 interface** This watchdogs monitors, whether a specific alarm bit is received from the CAN J1939 interface. This enables to configure the control in a way that a reaction is caused by this bit (e.g. warning, shutdown). No alarm can be indicated if the CAN communication fails.
Bat. overvoltage 1 **ID 10007**	**Battery overvoltage, limit value 1** The battery voltage has exceeded the limit value 1 for battery overvoltage for at least the configured time and did not fall below the value of the hysteresis.
Bat. overvoltage 2 **ID 10008**	**Battery overvoltage, limit value 2** The battery voltage has exceeded the limit value 2 for battery overvoltage for at least the configured time and did not fall below the value of the hysteresis.
Bat. undervoltage 1 **ID 10005**	**Battery undervoltage, limit value 1** The battery voltage has fallen below the limit value 1 for battery undervoltage for at least the configured time and has not exceeded the value of the hysteresis.
Bat. undervoltage 2 **ID 10006**	**Battery undervoltage, limit value 2** The battery voltage has fallen below the limit value 2 for battery undervoltage for at least the configured time and has not exceeded the value of the hysteresis.
CAN bus overload **ID 10089**	**CAN bus overload alarm** The sum of CAN bus messages on al can buses together exceeds 32 messages per 20 ms.
CAN fault J1939 **ID 10017**	**Interface alarm J1939** The communication with the ECU via the CAN bus interface has been interrupted and no data can be transmitted or received over the bus within the configured time.
CANopen Interface 1 **ID 10087**	**Interface alarm CANopen on CAN bus 1** No Receive Process Data Object (RPDO) is received within the configured time.
CANopen Interface 2 **ID 10088**	**Interface alarm CANopen on CAN bus 2** No message is received from the external expansion board (Node ID) within the configured time.
Charge alt. low volt **ID 4056**	**Charging alternator voltage low** The charging alternator voltage has fallen below the critical limit for at least the configured time and has not exceeded the value of the hysteresis (the critical limit is 9 V for 12 V systems and 20 V for 24 V systems).
Eng. stop malfunct. **ID 2504**	**Stop alarm of the engine** The engine failed to stop when given the stop command. When a stop command is issued a timer starts a countdown. If speed is still detected when this timer expires the controller recognizes an unsuccessful stop of the engine. An unsuccessful stop of the engine is determined if speed (measured by the generator frequency, the MPU, or the *LogicsManager* "ignition speed") is detected within the configured time after the stop signal has been issued.
EEPROM failure **ID 1714**	**The EEPROM checksum is corrupted** The EEPROM check at startup has resulted a defective EEPROM.
GCB fail to close **ID 2603**	**GCB failed to close** The easYgen has attempted to close the GCB the configured maximum number of attempts and failed. Depending on the configuration, the easYgen will continue to attempt to close the GCB as long as the conditions for closing the GCB are fulfilled.
GCB fail to open **ID 2604**	**GCB failed to open** The easYgen is still receiving the reply "GCB closed" after the GCB open monitoring timer has expired.
GCB syn. timeout **ID 3064**	**GCB synchronization time exceeded** The easYgen has failed to synchronize the GCB within the configured synchronization time.

Message text and ID	Meaning
Gen act.pwr mismatch **ID 2924**	**Generator active power mismatch** The deviation between the generator power and the active power set point has exceeded the limit for at least the configured time.
Gen. PF lagging 1 **ID 2337**	**Generator overexcited, limit value 1** The power factor limit 1 has been exceeded at the generator towards inductive (i.e. the current is lagging) for at least the configured time and did not fall below the value of the hysteresis.
Gen. PF lagging 2 **ID 2338**	**Generator overexcited, limit value 2** The power factor limit 2 has been exceeded at the generator towards inductive (i.e. the current is lagging) for at least the configured time and did not fall below the value of the hysteresis.
Gen. PF leading 1 **ID 2387**	**Generator underexcited, limit value 1** The power factor limit 1 has fallen below at the generator towards capacitive (i.e. the current is leading) for at least the configured time and did not exceed the value of the hysteresis.
Gen. PF leading 2 **ID 2388**	**Generator underexcited, limit value 2** The power factor limit 2 has fallen below at the generator towards capacitive (i.e. the current is leading) for at least the configured time and did not exceed the value of the hysteresis.
Gen. overcurrent 1 **ID 2218**	**Generator overcurrent, limit value 1** The generator current has exceeded the limit value 1 for the generator overcurrent for at least the configured time and did not fall below the value of the hysteresis.
Gen. overcurrent 2 **ID 2219**	**Generator overcurrent, limit value 2** The generator current has exceeded the limit value 2 for the generator overcurrent for at least the configured time and did not fall below the value of the hysteresis.
Gen. overcurrent 3 **ID 2220**	**Generator overcurrent, limit value 3** The generator current has exceeded the limit value 3 for the generator overcurrent for at least the configured time and did not fall below the value of the hysteresis.
Gen. overfrequency 1 **ID 1912**	**Generator overfrequency, limit value 1** The generator frequency has exceeded the limit value 1 for generator overfrequency for at least the configured time and did not fall below the value of the hysteresis.
Gen. overfrequency 2 **ID 1913**	**Generator overfrequency, limit value 2** The generator frequency has exceeded the limit value 2 for generator overfrequency for at least the configured time and did not fall below the value of the hysteresis.
Gen. overload IOP 1 **ID 2314**	**Generator overload IOP, limit value 1** The generator power has exceeded the limit value 1 for generator overload in isolated operation (MCB is open) for at least the configured time and did not fall below the value of the hysteresis.
Gen. overload IOP 2 **ID 2315**	**Generator overload IOP, limit value 2** The generator power has exceeded the limit value 2 for generator overload in isolated operation (MCB is open) for at least the configured time and did not fall below the value of the hysteresis.
Gen. overload MOP 1 **ID 2362**	**Generator overload MOP, limit value 1** The generator power has exceeded the limit value 1 for generator overload in mains parallel operation (GCB and MCB are closed) for at least the configured time and did not fall below the value of the hysteresis.
Gen. overload MOP 2 **ID 2363**	**Generator overload MOP, limit value 2** The generator power has exceeded the limit value 2 for generator overload in mains parallel operation (GCB and MCB are closed) for at least the configured time and did not fall below the value of the hysteresis.
Gen. overvoltage 1 **ID 2012**	**Generator overvoltage, limit value 1** The generator voltage has exceeded the limit value 1 for generator overvoltage for at least the configured time and did not fall below the value of the hysteresis.
Gen. overvoltage 2 **ID 2013**	**Generator overvoltage, limit value 2** The generator voltage has exceeded the limit value 2 for generator overvoltage for at least the configured time and did not fall below the value of the hysteresis.
Gen. rev/red. pwr.1 **ID 2262**	**Generator reverse power, limit value 1 / Generator reduced power, limit value 1** The generator power has exceeded the limit value 1 for generator reverse power / generator reduced power for at least the configured time and did not fall below the value of the hysteresis.
Gen. rev/red. pwr.2 **ID 2263**	**Generator reverse power, limit value 2 / Generator reduced power, limit value 2** The generator power has exceeded the limit value 2 for generator reverse power / generator reduced power for at least the configured time and did not fall below the value of the hysteresis.
Gen.ph.rot. mismatch **ID 3955**	**Generator rotating field mismatch** The generator rotating field does not correspond with the configured direction.

Message text and ID	Meaning
Gen.underfrequency 1 **ID 1962**	**Generator underfrequency, limit value 1** The generator frequency has fallen below the limit value 1 for generator underfrequency for at least the configured time and has not exceeded the value of the hysteresis. Additionally, the alarm has not been acknowledged (unless the "Self acknowledgement" is configured YES).
Gen.underfrequency 2 **ID 1963**	**Generator underfrequency, limit value 2** The generator frequency has fallen below the limit value 2 for generator underfrequency for at least the configured time and has not exceeded the value of the hysteresis.
Gen. undervoltage 1 **ID 2062**	**Generator undervoltage, limit value 1** The generator voltage has fallen below the limit value 1 for generator undervoltage for at least the configured time and has not exceeded the value of the hysteresis.
Gen. undervoltage 2 **ID 2063**	**Generator undervoltage, limit value 2** The generator voltage has fallen below the limit value 2 for generator undervoltage for at least the configured time and has not exceeded the value of the hysteresis.
Gen unloading fault **ID 3124**	**Generator unloading mismatch** The easYgen failed to reduce the generator power below the configured unload limit within the configured time.
Gen. volt. asymmetry **ID 3907**	**Voltage asymmetry** The generator phase-to-phase voltages have higher differences between each other than the configured limit value.
Ground fault 1 **ID 3263**	**Generator ground current, limit value 1** The measured or calculated ground current has exceeded the limit value 1 for the generator ground current for at least the configured time and did not fall below the value of the hysteresis.
Ground fault 2 **ID 3264**	**Generator ground current, limit value 2** The measured or calculated ground current has exceeded the limit value 2 for the generator ground current for at least the configured time and did not fall below the value of the hysteresis.
Inv. time overcurr. **ID 4038**	**Generator inverse time-overcurrent** Current monitoring with tripping time depending on the measured current. The higher the current is the faster the tripping time according to a defined curve. According to IEC 255 three different characteristics are available: normal, highly, and extremely inverse.
Mains decoupling **ID 3114**	**Mains decoupling is initiated** One or more monitoring function(s) considered for the mains decoupling functionality has triggered.
Mains overfreq. 1 **ID 2862**	**Mains overfrequency, limit value 1** The mains frequency has exceeded the limit value 1 for mains overfrequency for at least the configured time and did not fall below the value of the hysteresis.
Mains overfreq. 2 **ID 2863**	**Mains overfrequency, limit value 2** The mains frequency has exceeded the limit value 2 for mains overfrequency for at least the configured time and did not fall below the value of the hysteresis. Triggering this monitoring function causes the mains decoupling function to trigger.
Mains overvoltage 1 **ID 2962**	**Mains overvoltage, limit value 1** The mains voltage has exceeded the limit value 1 for mains overvoltage for at least the configured time and did not fall below the value of the hysteresis.
Mains overvoltage 2 **ID 2963**	**Mains overvoltage, limit value 2** The mains voltage has exceeded the limit value 2 for mains overvoltage for at least the configured time and did not fall below the value of the hysteresis. Triggering this monitoring function causes the mains decoupling function to trigger.

Message text and ID	Meaning
Mains phase shift **ID 3057**	**Mains phase shift** A mains phase shift, which has exceeded the configured limit, has occurred. Triggering this monitoring function causes the mains decoupling function to trigger.
Mains underfreq. 1 **ID 2912**	**Mains underfrequency, limit value 1** The mains frequency has fallen below the limit value 1 for mains underfrequency for at least the configured time and has not exceeded the value of the hysteresis.
Mains underfreq. 2 **ID 2913**	**Mains underfrequency, limit value 2** The mains frequency has fallen below the limit value 2 for mains underfrequency for at least the configured time and has not exceeded the value of the hysteresis. Triggering this monitoring function causes the mains decoupling function to trigger.
Mains undervoltage 1 **ID 3012**	**Mains undervoltage, limit value 1** The mains voltage has fallen below the limit value 1 for mains undervoltage for at least the configured time and has not exceeded the value of the hysteresis.
Mains undervoltage 2 **ID 3013**	**Mains undervoltage, limit value 2** The mains voltage has fallen below the limit value 2 for mains undervoltage for at least the configured time and has not exceeded the value of the hysteresis. Triggering this monitoring function causes the mains decoupling function to trigger.
Maint. days exceeded **ID 2560**	**Maintenance days exceeded** The generator run time has exceeded the configured number of days since the last maintenance period. Additionally, the alarm has not been acknowledged.
Maint. hrs exceeded **ID 2561**	**Maintenance hours exceeded** The generator run time has exceeded the configured number of operating hours since the last maintenance period. Additionally, the alarm has not been acknowledged.
MCB fail to close **ID 2623**	**MCB failed to close** The easYgen has attempted to close the MCB the configured maximum number of attempts and failed. Depending on the configuration, the easYgen will continue to attempt to close the GCB as long as the conditions for closing the MCB are fulfilled.
MCB fail to open **ID 2624**	**Failed MCB open** The easYgen is still receiving the reply MCB closed" after the MCB open monitoring timer has expired.
MCB syn. timeout **ID 3074**	**MCB synchronization time exceeded** The easYgen has failed to synchronize the MCB within the configured synchronization time.
Missing members **ID 4064**	**Missing load share members detected** The easYgen has detected that the number of available units for load sharing does not correspond with the configured number of members.
Mns act.pwr mismatch **ID 2934**	**Mains active power mismatch** The deviation between the import/export power and the active import/export power set point has exceeded the limit for at least the configured time.
Mns.ph.rot. mismatch **ID 3975**	**Mains rotating field mismatch** The mains rotating field does not correspond with the configured direction.
Operat. range failed **ID 2664**	**Measured values not within operating range** An alarm will be issued if ignition speed is exceeded and the measured values for generator and/or mains are not within the configured operating range. No alarm will be issued in idle mode. The exact tripping conditions for this monitoring functions are described in the configuration manual 37427 in the section " Configure Monitoring: Engine, Operating Range Failure".
Overspeed 1 **ID 2112**	**Engine overspeed, limit value 1** The engine speed has exceeded the limit value 1 for engine overspeed for at least the configured time and did not fall below the value of the hysteresis.
Overspeed 2 **ID 2113**	**Engine overspeed, limit value 2** The engine speed has exceeded the limit value 2 for engine overspeed for at least the configured time and did not fall below the value of the hysteresis.

Message text and ID	Meaning
Parameter alignment **ID 4073**	**LDSS parameter mismatch detected** The easYgen has detected that not all LDSS parameters are configured identically at all participating units. Refer to the "Multi-unit configuration check" section in the "Parameters" chapter of the Configuration Manual 37427 for a list of all monitored parameters.
Ph.rotation mismatch **ID 2944**	**Generator/busbar/mains phase rotation different** Generator, busbar or mains have different rotating fields. A CB closure is blocked.
Red stop lamp **ID 15125**	**Red stop lamp, J1939 interface** This watchdog monitors, whether a specific alarm bit is received from the CAN J1939 interface. This enables to configure the control in a way that a reaction is caused by this bit (e.g. warning, shutdown). No alarm can be indicated if the CAN communication fails.
Speed/freq. mismatch **ID 2457**	**Difference in frequency/speed measurement alarm** The speed differential between the generator frequency (ascertained by the generator voltage measurement) and the engine speed (measured by the MPU) has exceeded the configured limit value / differential frequency for at least the configured time and has not fallen below the value of the hysteresis. The alarm may also be triggered if the *LogicsManager* "ignition speed" is enabled and no electrical frequency is detected as well as the other way round.
Start fail **ID 3325**	**Failure of engine to start alarm** The generator set has failed to start after the configured number of attempts. Depending on the configuration, no more start attempt will be carried out until the alarm is acknowledged.
Unbalanced load 1 **ID 2412**	**Generator unbalanced load, limit value 1** The generator current has exceeded the limit value 1 for generator unbalanced load for at least the configured time and did not fall below the value of the hysteresis.
Unbalanced load 2 **ID 2413**	**Generator unbalanced load, limit value 2** The generator current has exceeded the limit value 2 for generator unbalanced load for at least the configured time and did not fall below the value of the hysteresis.
Underspeed 1 **ID 2162**	**Engine underspeed, limit value 1** The engine speed has fallen below the limit value 1 for engine underspeed and has not exceeded the value of the hysteresis.
Underspeed 2 **ID 2163**	**Engine underspeed, limit value 2** The engine speed has fallen below the limit value 2 for engine underspeed and has not exceeded the value of the hysteresis.
Unintended stop **ID 2652**	**Unintended Stop** The easYgen expects the generator to be running but a sudden underrun of the ignition speed has been detected.
Wb:<!--Analog input x--> refer to: Table 4-1 and Fehler! Verweisquelle konnte nicht gefunden werden. on page 50	**Analog input {x}, wire break** During measurement of the analog input a wire break was detected. This text may be assigned customer defined. The text in angular brackets is the default text.
<!--Discrete input x--> refer to: Table 4-2 on page 50	**Discrete input {x}, energized / de-energized** The actual state of the monitored discrete input is energized / de-energized (depending on the configuration) for at least the configured time. This text may be assigned customer defined. The text in angular brackets is the default text.
<!--Ext. Discrete input x--> refer to: Table 4-3 on page 50	**External discrete input {x}, energized / de-energized** The actual state of the monitored external discrete input is energized / de-energized (depending on the configuration) for at least the configured time. This text may be assigned customer defined. The text in angular brackets is the default text.
<!—Flexible limit x--> refer to: Table 4-3 on page 50	**Flexible threshold {x}, overrun / underrun** The actual value of the monitored analog value has exceeded / fallen below the threshold (depending on the configuration) for at least the configured time and did not fall below / exceed the value of the hysteresis. This text may be assigned customer defined. The text in angular brackets is the default text.

Analog input #	1	2	3
Message ID	10014	10015	10060

Table 4-1: Message IDs for analog inputs

Discrete input #	1	2	3	4	5	6	7	8	9	10
Message ID	10600	10601	10602	10603	10604	10605	10607	10608	10609	10610

Table 4-2: Message IDs for discrete inputs

External discrete input #	1	2	3	4	5	6	7	8
Message ID	16360	16361	16362	16364	16365	16366	16367	16368
External discrete input #	9	10	11	12	13	14	15	16
Message ID	16369	16370	16371	16372	16373	16374	16375	16376

Table 4-3: Message IDs for external discrete inputs

Flexible limit #	1	2	3	4	5	6	7	8	9	10
Message ID	10018	10019	10020	10021	10022	10023	10024	10025	10026	10027
Flexible limit #	11	12	13	14	15	16	17	18	19	20
Message ID	10028	10029	10030	10031	10032	10033	10034	10035	10036	10037
Flexible limit #	21	22	23	24	25	26	27	28	29	30
Message ID	10038	10039	10040	10041	10042	10043	10044	10045	10046	10047
Flexible limit #	31	32	33	34	35	36	37	38	39	40
Message ID	10048	10049	10050	10051	10052	10053	10054	10055	10056	10057

Table 4-4: Message IDs for flexible limits

Appendix B.
Restoring a Language Setting

Due to the multilingual capability of the unit, it may happen that the display language of the easYgen-2000 Series is set to a language, the operator is unable to read or understand, by mistake. In this case, the following proceeding helps to restore the desired language. The default setting is English.

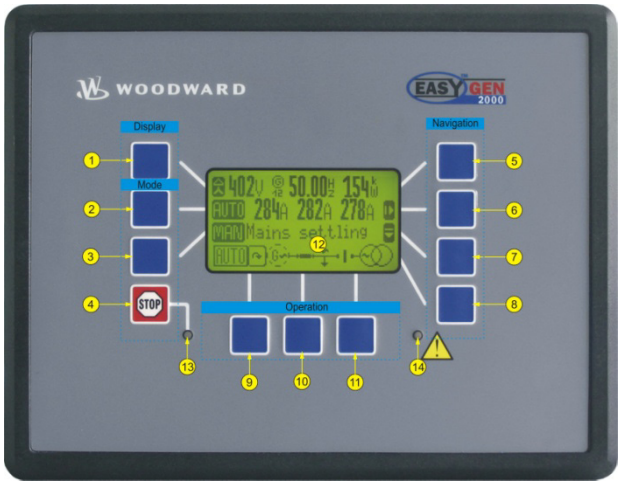


Figure 4-1: Front panel and display

Figure 4-1 refers to the different softkeys, which appear in the configured language. In order to change the language setting, press the softkeys in the following order:

1. Press softkey (5) until you return to the starting screen (as indicated above)
2. Press softkey (6) once to access the "Parameter" screen
3. Press softkey (7) twice to access the "Language / clock config." screen
4. Press softkey (8) twice to edit the language setting
5. Press softkey (6) to select the desired language
6. Press softkey (8) once to commit the language setting

Now, the display language is restored to the desired language again.

We appreciate your comments about the content of our publications.

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Please include the manual number from the front cover of this publication.

Woodward GmbH
Handwerkstrasse 29 - 70565 Stuttgart - Germany
Phone +49 (0) 711 789 54-0 • Fax +49 (0) 711 789 54-100
stgt-info@woodward.com

Homepage

http://www.woodward.com/power

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